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Retroperitoneal Tumors: Do the Satellite Tumors Mean Something?

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Background and Objectives: Primary retroperitoneal tumors constitute a rather uncommon disease with an incidence of 2 in 100,000. Local recurrence after surgical resection is reported between 60% and 90% at 10 yr. The aim of this study was to present the problem of satellite tumors around the main tumor mass and their possible relation to local recurrence.

Methods: Twenty-nine patients with retroperitoneal tumors underwent surgical resection in our department during an 8-yr period. We reviewed their records including their preoperative computed tomography (CT) scans.

Results: Twenty patients had ''complete'' resections requiring seven nephrectomies, four colectomies, two splenectomies, and one appendectomy. In nine cases the resection was incomplete because of tumor invasion to vital structures. Histopathology revealed that the resected tumors were: liposarcomas (12), leiomyosarcomas (4), paragangliomas (5), malignant fibrous histiocytomas (3), other sarcomas (3), schwannoma (1), myelolipoma (1), and the malignancy grade was I in 6, grade II in 11, and grade III in 12 cases. Two patients died within 30 d of the operation. The 1 year recurrence rate was 41.4% (12/29) and the total recurrence rate 55.2% (16/29). Survival at 5 yr was 31% (9/29), whereas the disease-free survival was 20.7% (6/29). Four patients required reoperations. In seven cases (24,1%) preoperative CT scans revealed small nodular lesions around the main tumor that were removed en bloc and were of the same histopathological type as the main tumor. We called these ''satellite'' tumors. All seven patients had local recurrence within 1 yr.

Conclusions: There seems to be a close relationship between the finding of satellite tumors and the recurrence of the disease. The existence of satellite tumors on the preoperative CT scan may be used as a guide for the extent of the resection, and further investigations are necessary before they are used as a prognostic sign.

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KEY WORDS: **retroperitoneal tumors; satellite tumors in retroperitoneum; myolipoma; malignant fibrous histiocytoma; paraganglioma; liposarcoma; leiomyosarcoma**

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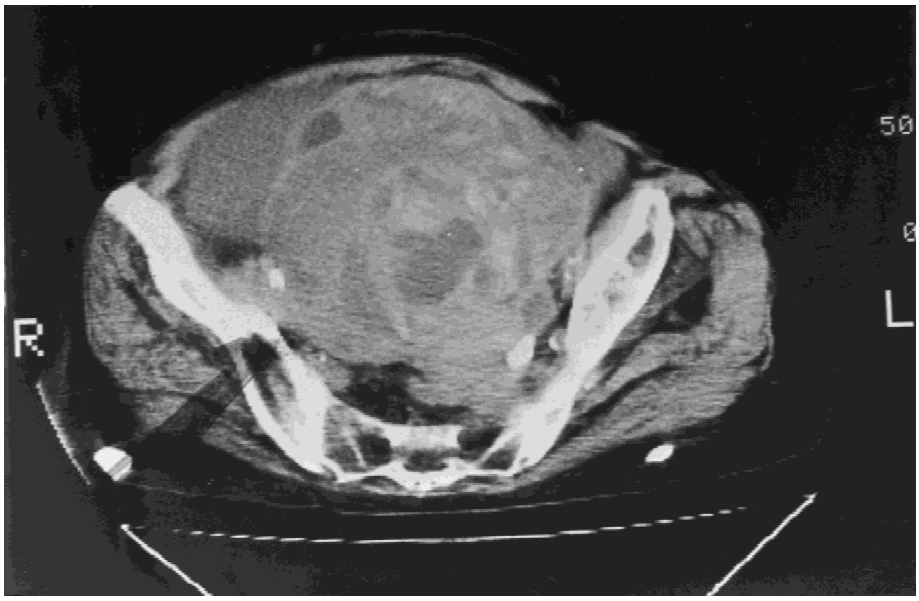

Fig. 1. CT picture of a huge liposarcoma in the pelvis. Satellite tumors are seen and were found during the operation.

INTRODUCTION

Primary retroperitoneal tumors have been a challenging problem for the general surgeon. They are usually asymptomatic and give nonspecific symptoms only when they grow to a considerable size [1–3].

Surgery is the most effective mode of treatment. Adjuvant chemoradiation therapy has not been proven to be beneficial, and many research protocols are still in progress [1,3,4].

These tumors are rather uncommon (incidence of 2 in 100,000), which limits the experience of the general surgeon. Specialized reference centers have been developed for the best treatment of primary retroperitoneal tumors. Local recurrence is reported as high as 90% at 10 yr [5–7], but can be as low as 60% at 10 yr in specialized centers [8,9].

The two main problems in the management of this disease are local recurrence and invasion to adjacent structures. Local recurrence seems to be related to the extent of the surgical resection. When the tumor invades adjacent vital structures, knowledge of the anatomy and surgical techniques are of paramount importance. Sometimes involved organs and even vessels have to be removed in order to give the patient the best chance for cure [8–10].

We reviewed our experience in the management of the retroperitoneal tumors. We also present a preoperative CT scan and operative finding that seems to be related to a very high recurrence rate in patients with small satellite tumors.

MATERIALS AND METHODS

Between 1988 and 1996, a total of 29 patients with retroperitoneal tumors were referred to the Second Department of Surgery of the University of Athens (Aretaeion Hospital).

Charts, histopathology slides, and CT scans were reviewed to determine histologic type, extent of resection, operative mortality, use of adjuvant therapy, and recurrence and survival data. The resection was considered to be ''complete'' when all the neoplasm was removed and the margins were free of neoplastic cells on microscopic examination.

Twenty-six patients were followed with CT scans every 6 months. All CT scans were reviewed by the same radiologist team.

RESULTS

The mean age of the 29 patients studied was 54.6 yr (range 6–79); 16 males and 13 females were included. Histologically, the disected tumors were classified as: liposarcomas, 12 (41.4%); leiomyosarcomas, 4 (13.8%); paragangliomas, 5 (17.2%); malignant fibrous histiocytomas, 3 (10.3%); other sarcomas, 3 (10.3%); schwannoma, 1 (3.4%); myelolipoma, 1 (3.4%). The tumor size ranged between 7 and 55 cm in greater diameter, and most of the tumors were >15 cm. One of the resected tumors weighed 11.5 kg.

Twenty patients had complete resections. In nine patients the resection was incomplete because of tumor invasion to vital structures. For the complete resections, en bloc excision of adjacent organs was required in many cases; seven nephrectomies, four colectomies, two splenectomies, and one appendectomy were performed. The grading of malignancy was I in 6, II in 11 and III in 12 cases.

Two patients died within 30 d of the operation. Perioperative mortality was 6.9% (2/29). Six patients re-

Fig. 2. Operation specimen of the case presented in Figure 1. The patient had a recurrence 8 mo later and died after 3 mo.

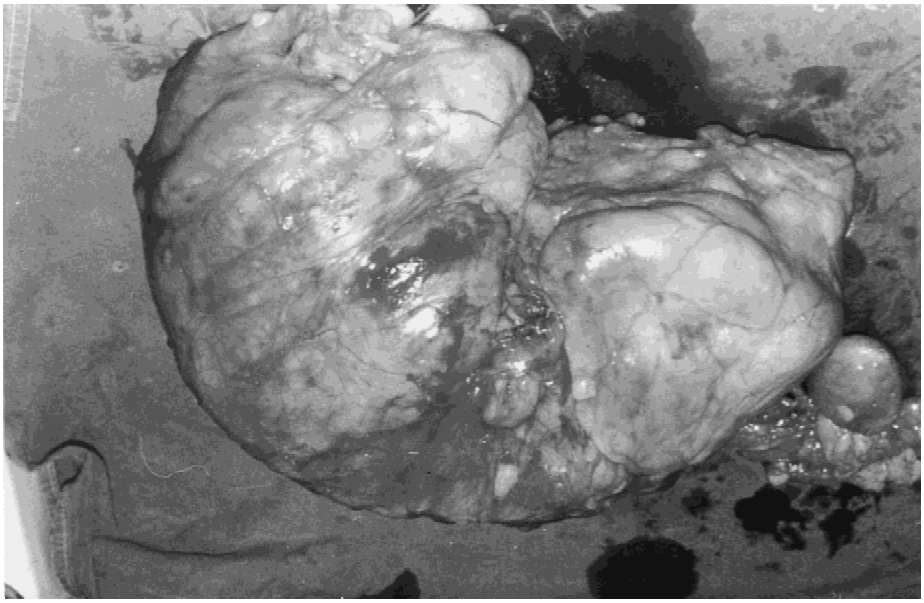

Fig. 3. The specimen of a large myxoid liposarcoma of the left retroperitoneal space with clear evidence of satellite tumors.

ceived adjuvant therapy, three had radiation, and three had chemotherapy. There was no strict protocol for the use of adjuvant therapy. Local recurrence occurred in eight patients during the first 6 mo and in another four patients during the first year. The 1-yr recurrence rate was 41.4% (12/29). There were four more recurrences later than 1 yr to a total of 55.2% (16/29).

The 5-yr survival rate was 31% (9/29) with 20.7% (6/29) disease-free survival and three patients are alive without proof of disease status (lost to follow-up CT appointments).

Four patients required reoperations. One of them required eight resections of the tumor in a period of 11 yr. This tumor began as a pelvic liposarcoma and finally extended to the mediastinum and retropleural space.

DISCUSSION

The probability of treatment in patients with retroperitoneal tumors is directly related to the success of the radical surgical resection of the tumor. The disease presents as a complex management problem for the sur-

geon, and experience is required for better results [8–11]. Even when the excision of the tumor is radical, recurrence is very common. In our series, a 55.2% (16/29) recurrence rate was observed.

During the review of preoperative CT scans, we observed what we called satellite tumors of unknown clinical significance. In seven of our patients, we could identify on the CT scans, small nodular lesions around the main tumor, in the soft tissues of the retroperitoneum (Figs. 1–3). Sometimes these nodules were a few centimetres away from the tumor. We were not able to find any reports in the literature regarding their existence and pathogenesis. We believe that these ''satellite'' tumors can represent either a local invasion of the same tumor, or a synchronous growth of multiple tumors. In these seven patients, during the operation we tried to eradicate all gross neoplastic mass. Nevertheless, all seven patients suffered from recurrence within 1 yr. The histology of these tumors varied: five liposarcomas, one myxoid liposarcoma, and one malignant fibrous histiocytoma. The size of the tumors ranged from 13–22 cm in diameter and they were grade II in three cases and grade III in four cases. We suspect that there might be more microscopic ''satellite'' tumors in the adjacent soft tissues that were the cause of recurrence in these patients. For this reason the resection of primary retroperitoneal tumors, through an extended laparotomy, with wide en bloc excision of surrounding soft tissues, seems absolutely necessary. We believe that simple excisions or denucluation of the tumor through lateral or lumbar incisions are not adequate for complete resections [8–10].

The existence of ''satellite'' tumors on the preoperative CT scan may be used as a guide for the surgical approach and the extent of the resection and may serve as a prognostic indicator. In order to clarify the clinical significance of this observation, better controlled and prospective studies are required before it can be used as a prognostic sign.

REFERENCES

1. Storm FK, Mahvi DM: Diagnosis and management of retroperitoneal soft-tissue sarcoma. Ann Surg 1991; 214:2–10.
2. Arlen M, Marcove R: Retroperitoneal sarcoma. In Arlen M, Marcove R (eds): ''Surgical Management of Soft Tissues Sarcomas.'' Philadelphia: W.B. Saunders, 1987: 203–232.
3. Wood WC, Tepper J: Retroperitoneal and abdominal wall sarcomas. In Raaf JH (ed): ''Soft Tissue Sarcomas: Diagnosis and Treatment.'' St. Louis, MO: Mosby, 1993: 181–186.
4. Willett CG, Suit HD, Tepper JE, et al.: Intraoperative electron beam radiation therapy for retroperitoneal soft tissue sarcoma. Cancer 1991; 68:278–283.
5. Cody HS, Turnbull AD, Fortner JG, et al.: The continuing challenge of retroperitoneal sarcomas. Cancer 1981; 47:2147–2152.
6. McGrath PC, Neifeld JP, Lawrence W Jr, et al.: Improved survival following complete excision of retroperitoneum sarcomas. Ann Surg 1984; 200:200–204.
7. Glenn J, Sindelar WF, Kinsella T, et al.: Results of multimodality therapy of resectable soft-tissue sarcomas of the retroperitoneum. Surgery 1985; 97:316–325.
8. Karakousis CP: Surgery for soft tissue sarcomas. In Bland KI, Karakousis CP, Copeland EM III (eds): ''Atlas of Surgical Oncology.'' Philadelphia: W.B.Saunders, 1995: 283–400.
9. Karakousis CP: The management of retroperitoneal sarcomas. In Antypas G (ed): Balkan Congress of Oncology Meeting Program 1996 July 3–7; Athens, Greece, 1996:401–405 [abstract].
10. Vezeridis MP, Wanebo HJ: Sacral resection of posterior pelvic malignancy. Cancer Investigation 1995; 13:375–380.
11. Bevilacqua RG, Rogatko A, Hajdu SI, Brennan MF: Prognostic factors in primary retroperitoneal soft-tissue sarcomas. Arch Surg 1991; 126:328–334.

COMMENTARY

The paper by Voros et al. illustrates the difficulties in completely resecting retroperitoneal tumors. In the excellent review by Storm and Mahvi (reference 1 of the paper) the resectability rate was 53% and the 5-year survival rate 34%. However, with modern surgical techniques (and perseverence on the part of the surgeon) the resectability rate is about 96% and the 5-year survival rate 63% [1].

The observation by Voros et al. of tumor nodules around the main retroperitoneal mass having an adverse effect on recurrence and survival rates conforms with what is known generally about the biologic behavior of tumors. Such tumor nodules most likely represent ''satellite'' lesions due to direct spread of tumor cells (via lymphatics or other means) in the surrounding tissues. ''Satellitosis'' is a visual manifestation of tumor aggressiveness and is associated with poor prognosis. Although uncommon, satellitosis around primary retroperitoneal tumors is not rare, but such cases considered to represent a more advanced stage are not usually included or reported with the primary retroperitoneal tumors.

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REFERENCES

1. Karakousis CP, Gerstenbluth R, Kontzoglou K, Driscoll DL: Retroperitoneal sarcomas and their management. Arch Surg 1995;130: 1104–1109.